Maryland Historical Trust

Maryland Inventory of Historic Properties number: WA-II-261

Name: 21032/MD 66 over Beaver Creek

The bridge referenced herein was inventoried by the Maryland State Highway Administration as part of the Historic Bridge Inventory, and SHA provided the Trust with eligibility determinations in February 2001. The Trust accepted the Historic Bridge Inventory on April 3, 2001. The bridge received the following determination of eligibility.

MARYLAND HISTORICAL TRUST

Eligibility Recommended _____ Eligibility Not Recommended __X____

Criteria: ____A ____B ____C ____D Considerations: ___A ___B ___C ___D ___E ___F ___G __None

Comments: _____

_____

_____

Reviewer, OPS: _Anne E. Bruder_____ Date: __3 April 2001____

Reviewer, NR Program: __Peter E. Kurtze_____ Date: __3 April 2001____

MARYLAND INVENTORY OF HISTORIC BRIDGES MHT No. WA-IV-261
HISTORIC BRIDGE INVENTORY
MARYLAND STATE HIGHWAY ADMINISTRATION/
MARYLAND HISTORICAL TRUST

SHA Bridge No. 21032 **Bridge name** MD 66 over Beaver Creek

LOCATION:
Street/Road name and number [facility carried] MD 66

City/town Cavetown, southwest of Smithsburg **Vicinity** ____

County Washington

This bridge projects over: Road____ **Railway**_____ **Water** X_____ **Land** ____

Ownership: State __X____ **County** _____ **Municipal** _____ **Other** _____

HISTORIC STATUS:
Is the bridge located within a designated historic district? Yes __X____ **No** _____
National Register-listed district ____ **National Register-determined-eligible district** __
Locally-designated district __X____ **Other** _____

Name of district Cavetown Historic District

BRIDGE TYPE:
Timber Bridge _____:
Beam Bridge _____ **Truss-Covered** ____ **Trestle** ____ **Timber-And-Concrete** ___

Stone Arch Bridge _____

Metal Truss Bridge _____

Movable Bridge ____:
Swing _____ **Bascule Single Leaf** __ **Bascule Multiple Leaf** _____
Vertical Lift _____ **Retractile**_____ **Pontoon** _____

Metal Girder_____:
Rolled Girder _____ **Rolled Girder Concrete Encased** _____
Plate Girder _____ **Plate Girder Concrete Encased** _____

Metal Suspension _____

Metal Arch _____

Metal Cantilever _____

Concrete X_____:
Concrete Arch_____ **Concrete Slab** __X__ **Concrete Beam** ____ **Rigid Frame** _____
Other _____ **Type Name** _____

DESCRIPTION:

Setting: Urban _____ **Small town** _____ **Rural** X

Describe Setting: Bridge No. 21032 carries MD 66 over Beaver Creek in Washington County. MD 66 runs north-south. Beaver Creek generally flows south, but it flows under MD 66 in an westerly direction. The area immediately around the bridge is surrounded by open fields and farms, and it is situated near Cavetown and southwest of Smithsburg.

Describe Superstructure and Substructure:

Bridge No. 21032 was built in 1932 using the 1924 Standard Bridge Plans. This is a single span, two-lane, concrete slab with flared concrete wingwalls and concrete abutments. It has concrete parapets, and the approaches have metal guiderails. The structure has a clear roadway width of 24'-0", a face to face width of 20'-0", and is 20' in length.

The most recent inspection report available from 1986 described the bridge condition as follows. The south abutment was in good condition. The north abutment was in fair condition with a large spall, moderate delamination, scaling, and efflorescence. The entire superstructure had moved 1 ½" from the south to the north. As a result of this displacement, the north abutment retaining wall cracked as well as both of the northern wingwalls. Similarly, both the southern wingwalls had vertical cracks, and the southeast wingwall was detached from the slab. The slab exhibited moderate scaling with some rusted rebar exposed, spalling, and efflorescence.

Discuss Major Alterations:

A steel pile bent was placed at midspan to eliminate a posting after 1989. It was considered a temporary repair at the time and was recommended for replacement. The 20' slab was converted into two 10' slabs by cutting the concrete railing at the center line of the bent and saw cutting 2"-3" of the top of the concrete slab. The bent was placed at midspan.

HISTORY:

WHEN was the bridge built (actual date or date range) 1932

This date is: Actual X **Estimated** _____

Source of date: Plaque _____ **Design plans** ____ **County bridge files/inspection form** ____

Other (specify) State Highway Administration Files

WHY was the bridge built?

Local transportation needs

WHO was the designer?

State Roads Commission

WHO was the builder?

State Roads Commission

WHY was the bridge altered?

Extension of the bridge's life.

Was this bridge built as part of an organized bridge-building campaign?

Yes, as a part of post World War I improvements to secondary roads.

SURVEYOR/HISTORIAN ANALYSIS:

This bridge may have National Register significance for its association with:
A - Events _____ B- Person _____
C- Engineering/architectural character _____

This bridge does not have National Register significance.

Was the bridge constructed in response to significant events in Maryland or local history?
Reinforced concrete slab bridges are a twentieth century structure type, easily adapted to the need for expedient engineering solutions. Reinforced concrete technology developed rapidly in the early twentieth century with early recognition of the potential for standardized design. The first U.S. attempt to standardize concrete design specifications came in 1903-04 with the formation of the Joint Committee on Concrete and Reinforced Concrete of the American Society of Civil Engineers.

Maryland's road and bridge improvement programs mirrored economic cycles. The first road improvement program of the State Roads Commission was a 7 year program, starting with the Commission's establishment in 1908 and ending in 1915. Due to World War I, the period from 1916 -1920 was one of relative inactivity; only roads of first priority were built. Truck traffic resulting from war-related factories and military installations generated new, heavy traffic unanticipated by the builders of the early road system. From 1920 to 1929, numerous highway improvements occurred in response to the increase in Maryland motor vehicles from 103,000 in 1920 to 320,000 in 1929, with emphasis on the secondary system of feeder roads which moved traffic from the primary roads built before World War I. After World War I, Maryland's bridge system also was appraised as too narrow and structurally inadequate for the increasing traffic, with plans for an expanded bridge program to be handled by the Bridge Division, set up in 1920. In 1920 under Chapter 508 of the Acts of 1920 the State issued a bond of $3,000,000.00 for road construction; the primary purpose of these monies was to meet the state obligations involving the construction of rural post roads. The secondary purpose of these monies was to fund [with an equal sum from the counties] the building of lateral roads. The number of hard surfaced roads on the state system grew from 2000 in 1920 to 3200 in 1930. By 1930, Maryland's primary system had become inadequate to the huge freight trucks and volume of passenger cars in use, with major improvements occurring in the late 1930s. Most improvements to local roads waited until the years after World War II.

With a diverse topographical domain encompassing numerous small and large crossings, Maryland engineers quickly recognized the need for expedient design and construction.

In the early years, there was a need to replace the numerous single lane timber bridges. Walter Wilson Crosby, Chief Engineer stated in 1906, "The general plan has been to replace these [wood bridges] with pipe culverts or concrete bridges and thus forever do way with the further expense of the maintenance of expensive and dangerous wooden structures". Within a few years, readily constructed standardized bridges of concrete were being built throughout the state.

The creation of standard plans and a description of their use was first announced in the 1912-15 Reports of the State Roads Commission whereby bridges spanning up to 36 feet were to use standardized designs.

Published on a single sheet, the 1912 Standard Plans included those structures that were amenable to such an approach: slab spans, (deck) girder spans, box culverts, box bridges, abutments, and piers

(State Roads Commission 1912). Slab spans, with lengths of 6 to 16 feet in two foot increments, featured a solid parapet that was integrated into the slab, with a roadway of 22 feet.

In the Report for the years 1916-1919, a revision of the standard plans was noted:

> During the four years covered by this report, it has been found necessary to revise our standard plans for culverts and bridges, to take care of the increased tonnage which they have been forced to carry. Army cantonments...increased their operations several hundred per cent, and the brunt of the enormous truck traffic resulting therefrom, was borne by the State Roads of Maryland. In addition to these war activities, freight motor lines from Baltimore to Washington, Philadelphia, New York, and various points throughout Maryland, and the weight of many of these trucks when loaded, was in excess of the loads for which our early bridges were designed (State Roads Commission 1920:56).

Published on separate sheets, the new standard plans (State Roads Commission 1919) for slab bridges reveal that the major changes was an increase in roadway width from 22 feet to 24 feet and a redesign of the reinforcement. The slab spans continued to feature solid parapets integrated into the span. The range of span lengths remained 6 to 16 feet, but the next year (1920) witnessed the issue of a supplemental plan for a 20 foot long slab span (State Roads Commission 1920).

The 1924 standard plans remained in effect until 1930, when the roadway width for all standard plan bridges was increased to 27 feet in order to accommodate the increasing demands of automobile and truck traffic (State Roads Commission 1930). The range of span lengths remained the same, but there were some changes designed to increase load bearing capacities. The reinforcing bars were increased in thickness. Visually, the 1930 design can be distinguished from its predecessors by the pierced concrete railing that was introduced at this time.

When the bridge was built and/or given a major alteration, did it have a significant impact on the growth and development of the area?
Unknown.

Is the bridge located in an area which may be eligible for historic designation and would the bridge add to or detract from the historic/visual character of the potential district?
Bridge No. 21032 is located near Cavetown, a small nineteenth century rural village and a locally designated historic district. Houses include sided log, brick, or frame structures, many of which have domestic outbuildings. Cavetown derives its name from Cave Hill, a nearby ridge with a cave which is said to have been the first commercial cavern in the United States. The bridge neither contributes to nor detracts from the district.

Is the bridge a significant example of its type?
Bridge No. 21032 is not a significant example of its type due to its deteriorating condition.

Does the bridge retain integrity of important elements described in Context Addendum?
No. This bridge has not retained the integrity of either its design or character defining elements.

Is the bridge a significant example of the work of a manufacturer, designer, and/or engineer?
No. This structure is not a significant example of the work of the State Roads Commission.

Should the bridge be given further study before an evaluation of its significance is made?
No, this structure should not be given further study. Although it reflects the state's need to expand secondary road system after World War I, its deteriorated condition has compromised its integrity.

BIBLIOGRAPHY:

County inspection/bridge files _____ **SHA inspection/bridge files** X
Other (list):

Maryland Historical Trust Inventory Form for Cavetown Historic District.

SURVEYOR:

Date bridge recorded August 1995
Name of surveyor Adrienne Beaudet Cowden
Organization/Address P.A.C. Spero & Company; 40 West Chesapeake Avenue, Suite 412; Baltimore, Maryland 21204
Phone number 410-296-1635 **FAX number** 410-296-1670

WA-IV-261

S.H.A. 61.2-52
9-18-81

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
DIVISION OF BRIDGE DEVELOPMENT

DESCRIPTION: BRIDGE # 21032 - RATING IF BENT PLACED AT MIDSPAN	CONTRACT NO.: 802-3102B	SHEET 1 OF 5
COMPUTED BY: GREG ROBY DATE: 7/24/89	CHECKED BY: J. JOHNSON DATE: 2/20/09	

TO CONVERT THE 20' SLAB INTO TWO 10' SLABS CUT THE CONCRETE RAILING AT ℄ OF THE BENT AND SAW CUT 2"-3" OF THE TOP OF THE CONCRETE SLAB. THIS WILL CONTROL THE LOCATION OF THE CRACK LETTING THE SLAB BECOME TWO SIMPLE SPANS ON ITS OWN. (NO TOP REINFORCING ACCORDING TO PLANS)

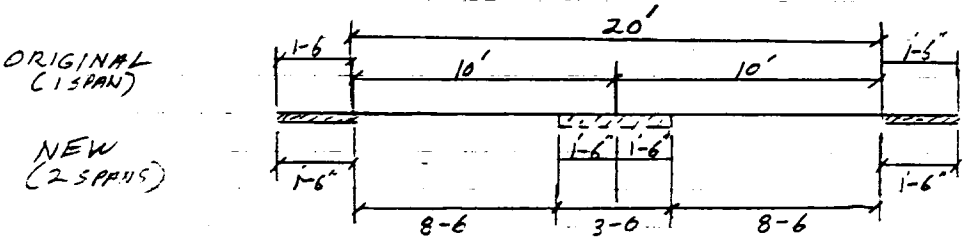
- 1924 STANDARD 20' SLAB BRIDGE BUILT 1932

original span length = 21.5'
slab thickness = 1.5'
main reinforcing // to traffic = 7/8" @ 5" (A_s = 1.44 in²/ft)
concrete is Class A ⇒ f'_c = 3000 psi

- wearing surface = 2" (recent district work)

$d = 18" - 1\frac{1}{2}" - 0.4375 = 16.0625"$

New span length for 2 simple spans assuming the same bearing area as original design:



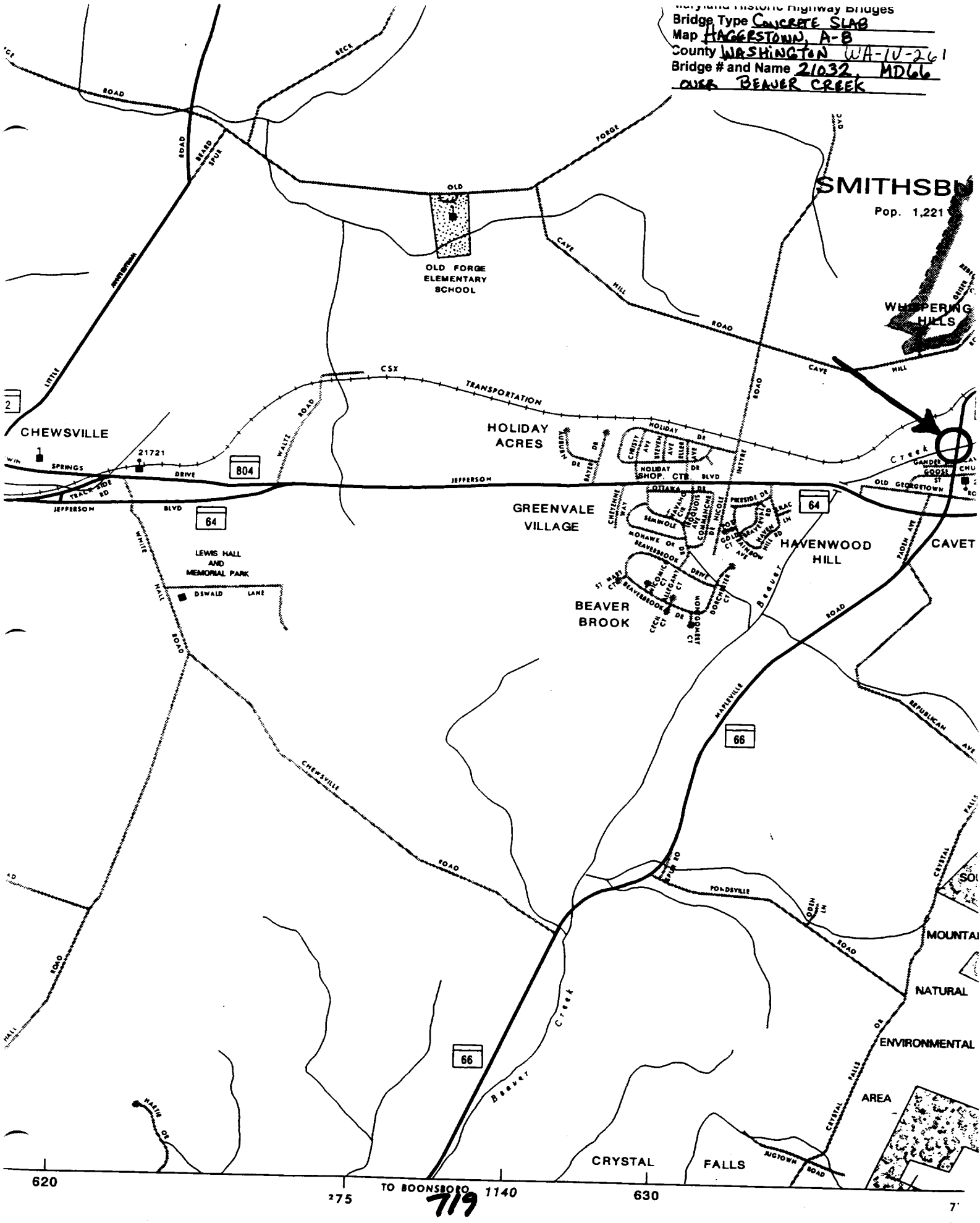
NEW SPAN LENGTH = (8'-6") + (1'-6") = 10'-0"

S = 10.0'

GREINER SURVEY SHOWS WRONG BRIDGE - NO ORIGINAL PHOTOS

$n = E_s/E_c = \frac{29 \times 10^6}{(57000)\sqrt{3000}} = 9.3 \quad \therefore \quad n = 10$

Maryland Historic Highway Bridges
Bridge Type CONCRETE SLAB
Map HAGERSTOWN, A-8
County WASHINGTON WA-IV-261
Bridge # and Name 21032, MD66
over BEAVER CREEK



MARYLAND GENERAL HIGHWAY

1 WA-IV-261

2 (3022) [illegible] BEAVER CREEK

WASHINGTON C., MD

4 D. KING

5 2/12/75

6 MD SHPO

7 SE ELEVATION

8 1/4

1 WA-IV-261

2 (21K03?) MD Lower Beaver Creek

3 Washington Co., MD

4 D. King

5 2/2015

6 MD SHPO

7 NW Elevation

8 2 of 4

1 WA IV-261

2 (21-[illegible]) MD 66 [illegible] Bridge [illegible]

3 Washington Co., MD

4 D. King

5 2/[illegible]

6 MD SHPO

7

8 3 of 4

1 WA II - 21c1

2 (21032) MD [illegible] BEAVER CR. K

3 WASHINGTON CO., MD

4 D. King

5 2/23/75

6 MD SLRD

7

8 [illegible]